Program Overview

Energy Savings Performance Contracts (ESPCs)

If you're doing all you can to meet your agency's energy efficiency, water conservation, and renewable energy goals but are frustrated by a lack of funds, then a Super ESPC could be the answer.

Alternative financing isn't just an "*alternative*" anymore – it's an essential tool for meeting our federal energy goals.

The Energy Policy Act of 2005 set new federal energy goals:

- Cut energy use (compared to 2003) by 2% per year in 2006 through 2015
- Increase use of renewable energy to not less than 3% of total electricity use in 2007 – 2009, not less than 5% in 2010 – 2012, and not less than 7.5% in 2013 and thereafter.

ESPCs Make Energy and Cost Savings Pay for Improvements

An ESPC is a contracting vehicle that allows agencies to accomplish energy projects for their facilities without up-front capital costs and without special Congressional appropriations to pay for the improvements.

An ESPC project is a partnership between the customer and an energy services company (ESCO). The ESCO conducts a comprehensive energy audit and identifies improvements that will save energy at the facility. In consultation with the agency customer, the ESCO designs and constructs a project that meets the agency's needs and arranges financing to pay for it. The ESCO guarantees that the improvements will generate savings sufficient to pay for the project over the term of the contract. After the contract ends, all additional cost savings accrue to the agency. Contract terms up to 25 years are allowed.

Super ESPCs Streamline the Process

Super ESPCs are indefinite-delivery, indefinite-quantity (IDIQ) contracts established by DOE to make ESPCs as practical and cost-effective a tool as possible for agencies to use. These "umbrella" contracts were competitively awarded to ESCOs who demonstrated their capabilities to provide energy projects to federal customers. The general terms and conditions are established in the IDIQ contracts, and agencies implement projects by awarding delivery orders to the Super ESPC ESCOs. Agencies can implement a Super ESPC project in far less time than it takes to develop a stand-alone ESPC project.

Congress and the President Encourage Agencies to Use ESPCs

Congress and the President encourage agencies to use ESPCs to finance and implement efficiency improvements and meet their energy goals. Legislation authorizing ESPCs was enacted in 1992, and DOE promulgated regulations for their use in 1995. Super ESPCs were placed to streamline the process in 1998, and ESPCs were reauthorized through 2016 by the Energy Policy Act of 2005.

"Maximizing energy efficiency and renewable energy is the domestic epicenter in the War on Terror and it is imperative that we maximize the partnerships between the public and private sectors in new and creative ways with a sense of seriousness, national purpose and the urgency the situation merits."

—Alexander A. Karsner
Assistant Secretary for Energy Efficiency and Renewable Energy

More than 400 ESPC projects have been awarded by 19 different federal agencies in 46 states. $1.9 billion has been invested in U.S. federal facilities through ESPCs, saving 16 trillion Btu annually, equivalent to the energy used by a city of about 450,000.

"…I encourage government officials to utilize ESPCs and Super ESPCs to meet their energy use reduction goals. These efforts will help conserve energy and create a better America for our children and grandchildren."

— President George W. Bush, April 25, 2006

ESPC PROGRAM OVERVIEW

WHAT AN ESPC PROJECT CAN DO FOR YOUR FACILITY: IMPROVEMENTS, BENEFITS, TECHNOLOGIES

TWO KINDS OF SUPER ESPCS

Regional "General-Purpose" Super ESPCs

The entire United States, and all U.S. Territories are covered by Regional Super ESPCs.

The Super ESPC ESCOs are listed at
www.eere.energy.gov/femp/financing/superespcs_espcescos.html

Regional Super ESPCs are intended for projects based on a wide variety of proven energy efficiency and conservation measures. Super ESPC ESCOs have demonstrated their capabilities with the following:

- Boiler and chiller plant improvements
- Building automation and energy management control systems
- Heating, ventilation, and air conditioning (HVAC) equipment
- Lighting improvements
- Building envelope modifications
- Chilled water, hot water, and steam distribution systems
- Electric motors and drives
- Refrigeration
- Distributed power generation systems
- Renewable energy systems
- Energy/utility distribution systems
- Water and sewer systems
- Electricity peak shaving or load shifting
- Energy cost reductions through rate adjustments
- Energy-related process improvements
- Other

Technology-Specific Super ESPCs

Technology-specific Super ESPCs can be used for federal facilities worldwide. These ESPCs emphasize four advanced technologies:

- Geothermal heat pumps
- Photovoltaics
- Biomass and alternative methane fuels
- Solar thermal

The emphasized technology must be the center of a tech-specific ESPC project, but bundling other technologies into these projects is allowed and encouraged.

For a list of delivery orders placed under Regional and Technology-Specific Super ESPCs, see FEMP's Web site at
www.eere.energy.gov/femp/financing/superespcs_awardedcontracts.html

Expert and Objective Technical Support

FEMP's ESPC team can provide technical assistance to assure successful, best-value energy projects.

FEMP project facilitators are experts in the field who guide agencies through the ESPC process. Project facilitators and others on FEMP's team provide consultation to agency customers on contracting and financing issues, measurement and verification, and technology and engineering issues.

The FEMP team's purpose is to help agencies implement projects that are financially smart, technically excellent, and contractually and legally sound.

Getting Started

To get started, FEMP provides free services through the Initial Proposal stage, without the need for an Interagency Agreement. After the Initial Proposal, FEMP services can be provided on a cost reimbursable basis. The Interagency Agreement spells out tasks and costs of FEMP project facilitation.

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Southeast region and Technology-Specific Contracts
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BENEFITS OF SUPER ESPCs

Goals

- Progress in meeting federal energy, water, renewables, and emissions-reduction goals

Quality and Value

- Access to private-sector expertise in energy efficiency, water conservation, and renewable energy
- Built-in incentives for ESCOs to provide high-quality equipment, timely services, and thorough project commissioning
- Infrastructure improvements to enhance mission support
- Healthier, safer working and living environments

Your Project, Your Way

- Flexible, practical contract and procurement process

Expert, Objective Technical Support

- FEMP team contracting and financing support, project facilitators, advanced technology experts, and training for agency teams

Smart Management

- Building efficiency improvements and new equipment without up-front capital costs
- Energy improvements without relying on special Congressional appropriations
- Guaranteed energy and related O&M cost savings
- Lower O&M costs
- Enhanced ability to plan and budget energy and O&M accounts
- Less vulnerability to budget impacts of volatile energy prices, weather, and equipment failure

Program Contact

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DOE FEMP Finance
Acquisition Support Team Leader
Please forward your ESPC information requests to the EERE Information Center at eereic@ee.doe.gov or call 1-877-337-3463.

SUPER ENERGY SAVINGS PERFORMANCE CONTRACTS

Benefits of Super ESPCs

Meeting Energy Goals
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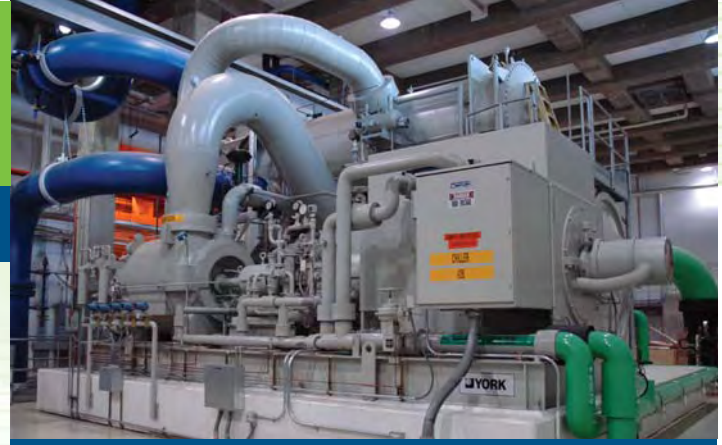

What an ESPC Project Can Do For Your Facility

FEMP's regional "all-purpose" ESPCs can be used anywhere in the United States or its Territories to install improvements in the technology categories listed below. Technology-specific Super ESPCs can be used for federal facilities worldwide and emphasize four advanced technologies: biomass and alternative methane fuels, geothermal heat pumps, solar thermal, and photovoltaics.

The emphasized technology must be the center of a tech-specific ESPC project, but bundling other technologies into these projects is allowed and encouraged.

- **Boiler and chiller plant improvements**
- **Building automation and energy management control systems**
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Energy Efficiency and Renewable Energy

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SUPER ENERGY SAVINGS PERFORMANCE CONTRACTS

A contracting method to help smart energy managers save energy, save money, and improve their facilities with no up-front capital costs

FEMP
Federal Energy Management Program

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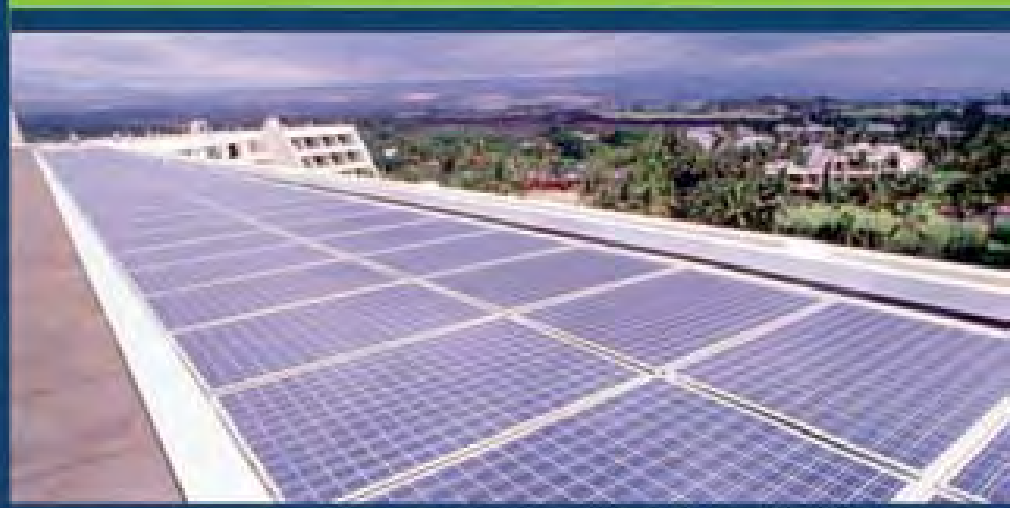
FEDERAL ENERGY MANAGEMENT PROGRAM

SUPER ENERGY SAVINGS PERFORMANCE CONTRACTS



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Bringing you a prosperous future where energy is clean, abundant, reliable, and affordable

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ESPCs *save* MONEY,
***save* TIME,**
***save* ENERGY,**
***deliver* VALUE**

WHY DO AN ESPC?

Meet energy reduction and environmental goals

Affirm agency commitment to these goals

Good for community relations

Improve facilities—comfort and reliability

Provide critical facility data

Save taxpayers' money

Avoid cost of delay and inaction

Quit deferring maintenance

GET A BETTER PROJECT

- Faster process and construction
- Better quality
- Interoperability
- Fixed-price contracts—no change orders

Built-in incentives mean value and quality

Contractor has incentives to:

— make all cost-effective improvements

— provide high-quality equipment that will perform long after installation

— do all punch list items quickly

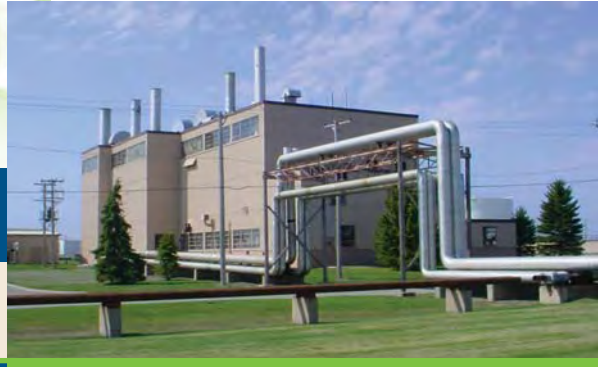
— do excellent commissioning

FACT SHEET

Federal Energy Management Program

Super ESPC – JUST THE FACTS

Energy Savings Performance Contracting



BACKGROUND

- Original ESPC legislation was passed by Congress in 1992. However, implementation did not begin until 1995 with promulgation of DOE's program regulations.
- In 1998, the procurement process was streamlined to make federal ESPC easier and more practical, and for the first time many agencies began to embrace ESPCs to meet their energy use reduction goals.

$1.9 BILLION INVESTMENT AND $5.2 BILLION ENERGY COST SAVINGS

- **$1.9 billion in private-sector funds has been invested in energy efficiency projects at federal facilities.**[1]
- These projects save 16 trillion Btu annually[2], equivalent to the energy consumed by 173,000 households[3] or a city of about a 450,000.[4]
- These projects will save the government $5.2 billion in energy costs. ($3.7 billion goes to pay off project investment.)[5]
- **Net savings to the government is $1.5 billion.**

FEDERAL ESPC PROJECTS IN 46 STATES

- Federal ESPC projects have been implemented by 19 different federal agencies and departments in 46 states.
- The Department of Defense has done the lion's share (60% of the projects and 70% of the investment dollars).
- More than 400 federal ESPC projects, altogether worth $1.9 billion, have been awarded through FY 2005.

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The statistics on federal ESPC use, investment, and savings in this fact sheet are from the information reported to FEMP by all federal agencies for its Annual Report to Congress on Federal Government Energy Management. For the most current published Annual Report, visit FEMP's web site at www.eere.energy.gov/femp/about/annual_report.html

Footnotes

[1] Based on federal agencies' annual data submissions to FEMP from FY 1998 onward.

[2] Determined by applying the average of 8000 Btu saved annually per dollar invested to the $1.9 billion ESPC investment, and assuming this represents 95% of actual savings.

[3] The conversion to households is derived from EIA Annual Energy Outlook Review 2005, Table 2.4.

[4] Based on U.S. Census data of 2.59 persons per household.

[5] Savings total is based on guaranteed savings (2.196 times investment per FY2000-2006 data); plus additional savings not guaranteed (ESCOs generally guarantee a conservative 95% of estimated savings); and 3 years of equipment service life after payments to the ESCO end.

June 2006

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FEMP

QUICK STUDY

Federal Energy Management Program

Savings and Performance Guarantees That Work for You

Fine Tuning for Best-Value Super ESPC Deals Using the Responsibility Matrix

Super Energy Savings Performance Contracts (Super ESPCs) are a practical and flexible tool for obtaining energy improvements for federal facilities. While the overarching Super ESPC establishes general terms and conditions of the agreement between the agency and the energy service company (ESCO), the contract leaves broad latitude to custom-tailor a deal to suit the agency's own particular needs, priorities, and circumstances.

The agency can precisely define the nature of the savings guarantee and how optimum performance of the energy conservation measures (ECMs) will be ensured throughout the life of the contract. A full awareness of all the options and associated costs can help the agency negotiate a deal that uses the agency's resources effectively, makes good business sense, and yields optimum value.

WHAT'S IN A GUARANTEE?

At the heart of a performance contract is a guarantee of a specified level of cost savings and performance. The customer is not obligated to pay for an unmet guarantee. The question is, what exactly is being guaranteed? Who is responsible for factors that affect performance and savings? And who pays for what?

A "Responsibility Matrix" in the Super ESPC (www.eere.energy.gov/femp/docs/r_r_matrix.doc) describes three categories of responsibilities or factors at work in the contract — operational, performance, and financial. The allocation of responsibilities between the agency and the ESCO defines the specifics of the guarantee, who does what, and who pays for what during the term of the contract. Early in the process of developing the project, the ESCO and the agency review the matrix and evaluate how to allocate these responsibilities, taking into consideration the agency's resources and preferences.

A few fundamental principles can be applied to the allocation of responsibilities in Super ESPC agreements:

- Logic and cost-effectiveness drive responsibility allocation.
- The responsible party then predicts its likely tasks and associated costs to fulfill its responsibility, and makes sure they're covered in the ESPC or the agency's budget (the government pays foreseeable costs).
- Unforeseen costs are paid by the party who caused the costs, or by the party who is responsible for that risk area.

FINANCIAL FACTORS: Energy Prices, Construction Costs, M&V Costs, Delays, Changes in Facilities, Interest Rates

Energy Prices

Energy prices, along with usage, determine the dollar value of the energy-cost savings guaranteed by the ESCO. Since neither party has any control over energy prices, agencies and ESCOs generally opt for simple and practical ways to arrive at prices to use in savings calculations. A common practice is to stipulate current energy prices for the first year of the contract and use the energy price escalators published by DOE's Energy Information Administration for succeeding years (www.eia.doe.gov/oiaf/aeo/index.html).

The chances that this approach will have serious financial consequences for the agency are very small. If prices turn out to be lower than expected, "savings" may be smaller on paper than projected, but the agency benefits from the lower prices and will be able to pay its bills. If energy prices are higher than projected, savings will exceed expectations, and the problem of higher prices will be easier to manage because the agency will be buying less energy than before the Super ESPC project. Keep in mind that the primary purpose of the guarantee is to ensure that the agency will be able to pay all its bills — to the ESCO and for energy and related operations and maintenance (O&M) — from its annual energy and related O&M appropriations.

Construction Costs

The ESCO can control construction costs and generally guarantees a firm, fixed price for the project, typically taking bids and locking in subcontractor prices before submitting the final proposal. Contract and price modifications are rare in Super ESPC projects.

M&V Costs

In considering the wide range of measurement and verification (M&V) options and costs, the key questions are:
(1) How much do I want to spend?
(2) What degree of accuracy do I need?
(3) What are the tradeoffs?

Some agencies want more detailed data to verify savings to a very high degree of confidence and are willing to pay the price. Those intent on getting as many improvements as possible (to generate more savings) can take a practical, but less elaborate, less expensive approach. M&V costs in Super ESPC projects have averaged 3.86% of first-year guaranteed cost savings, with half of these projects keeping costs below 2.5%.

Major Changes in Facilities

Agencies who are certain that major changes are planned for some of their facilities should not pursue Super ESPC projects in those buildings, and buildings of questionable longevity should obviously not be included in improvement projects. However, agencies must work with the information available to them, and valuable opportunities for achieving energy savings and improvements in government facilities shouldn't be missed for lack of a crystal ball.

Even if a facility were closed during the Super ESPC term, the government's financial obligations would be only the usual ones associated with closing facilities. To keep financiers comfortable (and interest rates as low as possible), the contract should include pre-negotiated terms for retirement of debt upon termination for convenience.

Interest Rates

Neither the ESCO, the agency, nor the financier controls interest rates. However, financing transaction costs can be affected by the agency's choices. Understanding the structuring, costs, and logic of private-sector financing for Super ESPC projects will help agency acquisition teams accelerate the negotiation and approval of delivery orders and keep financing costs as low as possible.

OPERATIONAL FACTORS: Operating Hours, Plug Load, Weather, User Participation

Operating hours, plug load, weather, and user participation (or occupancy effects) may all affect energy usage and cost. In Super ESPC delivery orders, savings are calculated in relation to a baseline that represents the energy and related costs that would have occurred if the status quo had been maintained and no new ECMs had been installed. The agency and the ESCO agree on the baseline (or how the baseline will be determined) and how savings will be calculated and compared to the guarantee for verification. The guarantee and the method for verifying savings must be documented in the contract in a way that accounts for potential impacts of operational factors.

Over the term of the contract, if building occupants acquire no new electrical equipment that increases plug load, if the weather is not extreme, and if operating hours remain the same, the ESCO's estimates of energy savings will likely prove accurate and the guarantee will be met. However, if extreme weather occurs, if occupants increase the number of computers or other office equipment in use, or if a plant adds a second shift, energy usage will increase and savings may appear smaller than expected. Who is responsible for this increase in energy use under the contract? The agency, as the party with the greatest ability to cost-effectively control operational factors, generally takes financial responsibility. Even when the project doesn't totally eliminate potential cost increases from operational factors, it does minimize cost increases and make them more manageable than before.

Operating Hours and Plug Load

The agency generally assumes financial responsibility for operating hours and load in one of two ways:

1. Baseline adjustments. The contract can allow specified baseline adjustments for changes in operational factors so that savings calculated in relation to the higher baseline will better reflect the savings attributable to the new ECMs. Baseline adjustments must be supported by measurements.
2. Stipulation. Both parties can accept stipulated operational factors and estimated savings based on engineering calculations and measurements as a fair representation of savings. If related requirements are met (i.e., satisfactory commissioning results and maintenance tasks performed), the guarantee is considered to be met.

Operating hours and plug loads are often stipulated. With well-proven, predictable technologies, stipulation is often the most practical choice. The alternative is for the agency to spend money on measurements and monitoring just to check up on itself.

Weather

No one but Mother Nature controls the weather, but it can be a major factor in energy usage. A sensible approach is to normalize calculations of the baseline and yearly energy savings to a typical weather year. In mild weather years, savings will seem small, but the energy bill will also be smaller than normal and the ESCO payment manageable, with funds to spare. In extreme weather, savings will exceed expectations, and it will be easier for the agency to manage and pay all its bills than before the project.

User Participation

The behavior of building occupants is subject to only minimal control by anyone. One strategy for handling occupancy effects is to stipulate comfort settings to use in calculations and document the baseline.

PERFORMANCE FACTORS/ RESPONSIBILITIES: Equipment Performance, O&M, R&R

Performance of the ECMs is the foundation of the guarantee and the value of the project. The ESCO is ultimately responsible for selection, application design, installation, and performance of the equipment, and must maintain specified standards of service (temperature, humidity, lighting levels, etc.). To be negotiated and spelled out in the contract are:

(1) whether the ESCO will carry this responsibility just through project acceptance by the agency, for a limited period to prove performance and standards of service, or for the entire term of the contract;
(2) how performance and standards of service will be verified; and
(3) what the consequences for unacceptable performance and standards of service will be.

Responsibility for O&M and equipment repair and replacement (R&R) is negotiable and may be assumed by the ESCO, agency staff, or subcontractors. In any case, it is critical to spell out how proper performance of these functions will be ensured.

Typically the agency operates the equipment with ESCO oversight. Maintenance can go either way, but the ESCO is always responsible for defining the maintenance program and verifying execution. Generally the ESCO is responsible for R&R through extended equipment warranties. However, individual agencies should negotiate whatever arrangement best addresses their needs. Some choose to keep all of these functions in-house to minimize the cost of the project; others lack the in-house capability or prefer to pay more for the "insurance" of having one responsible party for all these functions.

CONCLUSIONS

FEMP's experience with Super ESPCs is proving them to be a flexible and practical vehicle for custom-tailoring energy projects to agencies' site-specific needs. Agencies can optimize the value of their projects by taking advantage of the broad latitude in the contracts to fine-tune the guarantee, specify ESCO services, and allocate responsibilities to suit their own in-house resources, capabilities, and priorities.

The wide range of M&V options available also allows agencies to "build to suit." M&V plans can call for complex, detailed verification schemes with correspondingly high costs, but can also provide for acceptable verification through less expensive means. M&V costs for half of all Super ESPC projects have been a reasonable 2.5% of first-year cost savings. Interest rates for Super ESPC projects have been reasonable as well and are no obstacle to structuring solid pay-from-savings projects.

The responsibility matrix is a convenient, useful format for agencies to use to study and understand all aspects of the Super ESPC deal. Using the matrix to consider the options and balance corresponding costs and benefits will help agencies build best-value energy projects and meet federal energy goals.

Program Contact

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Please forward your ESPC information requests to the EERE Information Center at eereic@ee.doe.gov or call 1-877-337-3463.

June 2006

This publication and other guidance and tools pertaining to Super ESPCs are available on FEMP's ESPC Contract Tools pages: www.eere.energy.gov/femp/financing/superespcs.html

Federal Energy Management Program

ESPC Success Stories

Water Conservation and Green Energy

Work done under an energy savings performance contract enables Dyess Air Force Base to use Abilene's effluent water for irrigation, saving 160 million gallons of potable water and $300,000 a year. Fusion-welded polyethylene piping connects Abilene's effluent supply line to a holding reservoir on the base (pictured at top right).

Trent Mesa Wind Site, Trent TX

In January 2003, Dyess AFB became the largest single user of wind energy in the United States. The base now procures 100% of its electric power via "Green Wind Energy," offsetting 78 gigawatt-hours of electrical usage and reducing carbon dioxide emissions by 58,000 tons per year.

DYESS AIR FORCE BASE
DYESS, TEXAS

Dyess Air Force Base and surrounding west Texas has been under extreme-drought water restrictions for years. To ease the stress on the nearby city of Abilene's potable water supply, Dyess began using the city's effluent water for irrigation. They arranged to use existing oil pipelines to economically transport the water 7 miles from the city to the base. Dyess also entered into an energy savings performance contract to add two 11-million-gallon holding reservoirs, two pump stations, and 3 miles of distribution piping to connect the irrigation system. The project reduces annual potable water consumption by 160 million gallons and saves the base $300,000 a year. It also saves the city a highly valued 2% of its water supply.

U.S. AIR FORCE

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http://www1.eere.energy.gov/femp/financing/superespcs_contacts.html

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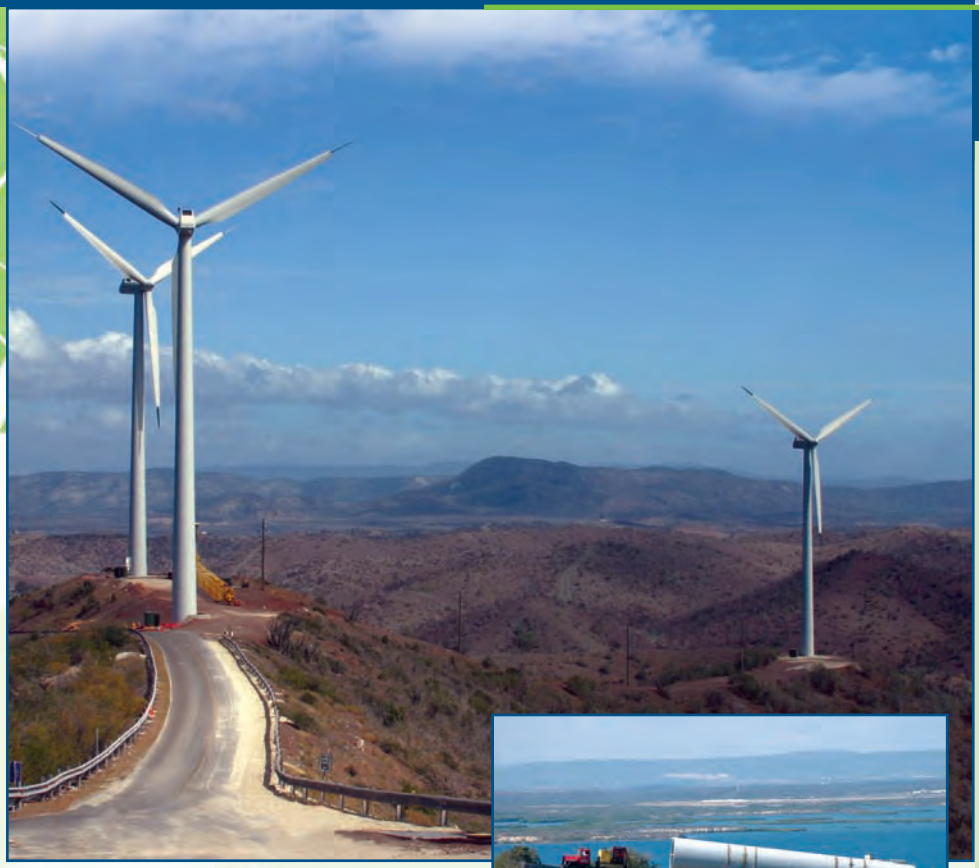
ESPC Success Stories

Environmental Stewardship and Cost Savings



These photographs chronicle the installation of the wind turbines at John Paul Jones Hill, Guantanamo Bay. The four wind turbine towers are about 185 feet high. The blade lengths are 90 feet. The top of the blades are about 275 feet off the ground. The blades rotate at a maximum of 22 RPM, or a rotation every three seconds. This translates to a blade tip speed of 140 mph.

During construction there were as many as 20 workers on the project. However, operating the wind turbines will only take one part-time staff-person who will check on them daily.

Photos courtesy of: Jeffrey M. Johnston, Public Works Officer, Guantanamo Bay; Paul DelSignore, NFESC; Daniel Ingold, NORESCO.

U.S. NAVAL STATION GUANTANAMO BAY, CUBA

The Department of the Navy partnered with NORESCO to construct a $12 million wind turbine project at Guantanamo Bay, Cuba, using an energy savings performance contract. Four wind turbines will generate 3,800 kilowatts of electricity – enough to supply about a quarter of the peak power needed for base operations. The project will not only save taxpayers $1.2 million in annual energy costs, but will also save 650,000 gallons of diesel fuel and reduce air pollution by 26 tons of SO_2 and 15 tons of NO_X, demonstrating the Navy's commitment to energy conservation and environmental stewardship.

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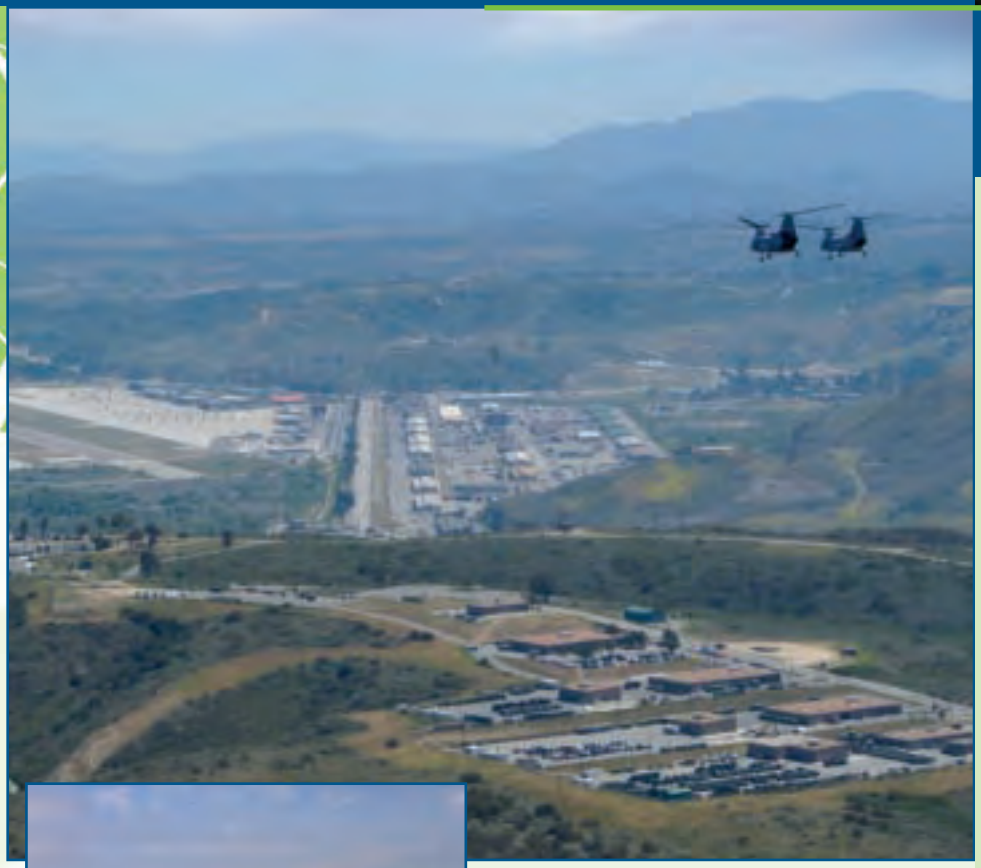
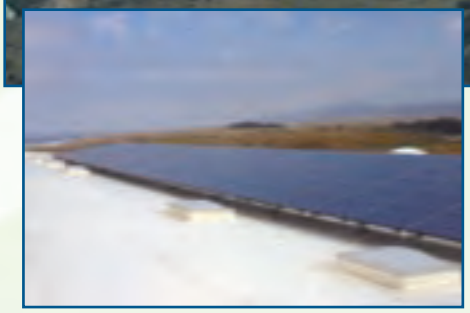
Federal Energy Management Program

ESPC Success Stories

Comprehensive Effort Cuts Energy Use By 44%





Camp Pendleton's energy reduction plan included a roof-mounted photovoltaic system. (above)

Much of Camp Pendleton's electrical load reduction was due to 42 buildings being outfitted with daylighting technology. Additionally, 51 buildings were retrofitted from high-intensity-discharge fixtures to high-output T-5 HO (fluorescent) fixtures. (top right)

Solar street lights, warning signs, and anti-terrorism lighting enhance driver safety, reduce grid-connected energy costs, and improve base security.

MARINE CORPS BASE CAMP PENDLETON

CAMP PENDLETON, CALIFORNIA

The energy team at Marine Corps Base Camp Pendleton has achieved a 44 percent reduction in energy consumption, reaching the energy goal mandated by Executive Order 13123 six years early. Camp Pendleton realized these accomplishments despite a 2 million-square-foot increase in facility space. The Marine Corps cut the base's energy use through successful implementation of energy savings performance contracts and utility energy services contracts, combined with energy education and awareness programs. Projects included decommissioning a large central steam plant and incorporating Leadership in Energy and Environmental Design (LEED™) standards into all construction projects. The base saved more than $3 million in energy costs and almost 280 billion Btu in FY 2004 alone.

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